THURSDAY, AUGUST 26, 1915.

EVOLUTION: ORGANIC AND SOCIAL.

(1) *Evolution and the War.* By Dr. P. Chalmers Mitchell. Pp. xxv + 114. (London: John Murray, 1915.) Price 2*s.* 6*d.* net.

(2) *Societal Evolution: a Study of the Evolutionary Basis of the Science of Society.* By Prof. A. G. Keller. Pp. xi + 338. (New York: The Macmillan Co.; London: Macmillan and Co., Ltd., 1915.) Price 6*s.* 6*d.* net.

(3) *Symbiogenesis: The Universal Law of Progressive Evolution.* By H. Reinheimer. Pp. xxiii + 425. (London: Knapp, Drewett and Sons, Ltd., 1915.) Price 10*s.* 6*d.* net.

(1) DR. CHALMERS MITCHELL'S vivid book begins with an interesting personal preface concerning his relations (as student and expert and *Saturday Reviewer*) with Germany. The first chapter deals with war and the struggle for existence, and contains a destructive criticism of von Bernhardi's "great verity" that "war is a fundamental law of evolution." The second chapter refutes some of the widespread misconceptions of the struggle for existence, and is a timely corrective. Taking the instances of dingo replacing thylacine, of the alleged war to the death between brown rat and black rat, and of the competition of cockroaches, the author shows that the cases are rarely stated with accuracy, and that they do not substantiate the conclusion that an incessant internecine warfare obtains throughout nature. We think that Dr. Chalmers Mitchell draws his bow too tightly when he declares (p. 23) that the competition Darwin chiefly thought of is internal, amongst the individuals of a species; and on the other hand, that he would have strengthened his position by extending it, by recognising that the technical phrase "the struggle for existence" includes all the reactions (non-competitive as well as competitive) that living creatures make to the pressure and stimulus of environing limitations and difficulties.

The third chapter is devoted to showing that even if the struggle for existence were the law of organic evolution (an unacceptable way of putting it), modern nations are not units of the same order as those of the animal and vegetable kingdom. A modern nation is not unified by blood-relationship; a political community coheres "because of bonds that are peculiar to the human race."

The fourth chapter expresses a wholesome scepticism as to the degree in which the stock of a nation can be altered by selective or eliminative agencies. Thus the author does not share the dread that some biologists have expressed of the dysgenic effects of the present war. But we do not yet—alas!—know the limit of the sifting. The fifth chapter defends the proposition that

> "The most important of the moulding forces that produce the differences in nationality are epigenetic, that is to say that they are imposed on the hereditary material and have to be re-imposed in each generation." "The environment of the body and the environment of the mind determine national differences."

What is said in regard to the importance of the environmental factor carries conviction, but when the author expresses his belief that "nurture is inconceivably more important than nature," he is opposing complementary, not antithetic, factors, and committing the same error as that which he condemns in the pronouncements of those who have said that in the case of man hereditary nature has "an overwhelmingly greater significance" than nurture.

The book closes, all too soon for our taste, with a fine and often eloquent statement of the author's position in regard to the apartness of man from other living creatures. Organically we are mammals and "rooted deep in the natal mud" (an ungrateful phrase), but

> "Our possession of consciousness and the sense of freedom is a vital and overmastering distinction. For man is not subject to the laws of the unconscious, and his conduct is to be judged not by them, but by its harmony with a real and external not-self that man has built up through the ages."

We think again that the author draws his bow too tightly, but it is of great interest to find this "hard-shell Darwinian evolutionist, a lover of the scalpel and microscope, and of patient empirical observation, who dislikes all forms of supernaturalism, who does not shrink" (Heaven forfend us from not shrinking from such nonsense) "from the implications of the phrase that thought is a secretion of the brain as bile is a secretion of the liver," asserting "as a biological fact that the moral law is as real and as external to man as the starry vault."

No one ever quite agrees with his brother's philosophy, but we think that all readers of this little book (and may there be many of them!) will agree in gratitude to the author. For what he has said is marked with sincere and resolute thinking, and is especially valuable at the present time.

(2) Prof. Keller is convinced that any fruitful study of the science of society must rest on a clear understanding of the Darwinian theory, and,

furthermore, "that the Darwinian factors of variation, selection, transmission, and adaptation are active in the life of societies as in that of organisms." His aim is to discover how far societary variation, selection, transmission and adaptation are the same as organismal variation, selection, transmission and adaptation. He recognises, indeed, that adaptations in mankind have come to be mainly mental and external (for we transform our environment as much as we are transformed by it), but he goes back to the simple and fundamental "folk-ways," which "form the germ and matrix of all human institutions," and inquires whether these are "adaptive by way of the activity of factors of the order of those operative in organic evolution."

The beginning of evolution is variation, and societary variations arise from individual initiatives unconscious or conscious. If these are effective and are diffused, obtaining group-approval, they become part of the body of folk-ways or of a thought-out social policy. As social phenomena they are subjected to societary selection, which the author proceeds to analyse. There are many forms of group-conflict and inter-group conflict, from internecine life and death struggle at the one extreme to the antagonism between class-codes at the other, but, on the whole, the automatic societal selection is on a different plane from natural selection. For one thing, there is "a lack of that precision, exactitude, and finality characteristic of a nature-process."

Elimination is much less thorough and survival is in virtue of social rather than biological superiorities. But emerging out of these automatic forms of societal selection there is deliberate rational selection, which works by rational criticism of the arts of societal self-maintenance. The practical difficulty arises, however, that forms of societal selection may run counter to natural selection by favouring the survival of those who are, when judged by biological standards, relatively less fit. Under the title of "counter-selection," this difficult problem is shrewdly discussed, the author's general position being that a certain amount of counter-selection is, at present at least, inevitable, and that it is to be met by more carefully thought-out rational selection. Thus the dysgenic results of war may be met or mitigated by more attention to practicable eugenics.

Turning to societary transmission—notably of the folkways which persist from generation to generation—the author points out that psychical qualities are transmitted in the biological sense, but much more is effected by tradition, both by positive inculcation and by unconscious imitation. The resultant of societary variation, selection, and transmission is adaptation, which the last quarter of the book illustrates. The author seeks to show that folkways and institutions are established as adaptations to particular settings in time and place. In the Eskimos, for instance, he finds "a primitive and isolated society, a survey of whose mores indicates beyond question the close adaptation of the maintenance-mores to environmental conditions, and the consistency of the other mores with those of self-maintenance." Another illustration worked out is that of two types of frontier-societies, the one in the temperate zone and the other in the tropics. Finally, the author uses "the modern great city as the best example at hand after which to outline the adaptation of the mores to the artificialised environment."

The whole book is interesting and will be valuable to those who wish to clear up their ideas in regard to "societal evolution." There is at times a tendency to a discursive exposition of the obvious, and to what seems to us an unnecessary amount of quotation from the late Prof. Sumner (of whose work this essay is regarded by the author as an extension); the reader may also be troubled a little by the reiteration of the words "folkways" and "mores," and by the occurrence of others even less familiar, such as "acculturation," "ethnocentrism," and "aleatory," but these are trifles compared with the fact that Prof. Keller has made a stimulating contribution towards answering the question: How does evolution in societary forms agree with, and differ from, evolution among organisms, both in itself and in the factors that bring it about?

(3) Mr. Reinheimer's book is marked by seriousness of purpose, width of inquiry, and a grasp of several important truths; it is marred by a lack of scientific precision and restraint, and by a litter of quotations of diverse values which have not always been understood. The author discourses at length on many subjects, such as genetics, of which he betrays inadequate understanding, and we think that he writes a lot of nonsense about the "symbiogenetic" potency of "love-foods"—which are the by-products of plant-reproduction, such as dates, raisins, bananas, legumes and cereals, with milk and eggs thrown in.

"To eat pork, hare, and shellfish is certainly not in accordance with the grand symbiotic division of labour which has established itself as the normal rule of life, demanding cross-feeding in the best interests of this symbiosis. Such habits are, on the contrary, opposed to the normal order, and result in an inferior physiological currency establishing itself at the expense of a nobler currency. This cannot lead to symbiogenesis, but must lead to pathogenesis."

The author is on firmer ground when he illustrates the widespread occurrence of interrelations linking organisms to organisms in mutual dependence and influence. Symbiogenesis is defined (by no means clearly) as "the mutual production and symbiotic utilisation of biological values by the united and correlated efforts of organisms of all descriptions," and the author's thesis is that this principle underlies "all creative life, all progressive evolution."

It seems to us a defensible proposition that there has been throughout organic evolution a complexifying of interrelations in the web of life. For a recognition of this truth we have to thank Darwin more than anyone else; therefore while we agree with Mr. Reinheimer that the struggle for existence includes much more than internecine competition, we deprecate the clumsiness (or worse) of a sentence like this (p. 399):

> "We may likewise excuse Darwin for making a sweeping metaphor do (substitute) service pending the lack of systematic study and knowledge concerning the fundamentally important co-operative (symbiotic) factors which, indeed, he had not entirely overlooked, though insufficiently appreciated."

On page 401 we notice that the name of a naturalist "of world-fame" is three times misprinted.

BOOKS ON COTTON PRODUCTION.

(1) *The World's Cotton Crops.* By Prof. J. A. Todd. Pp. xiii+460. (London: A. and C. Black, Ltd., 1915.) Price 10*s.* net.

(2) *The Development and Properties of Raw Cotton.* By W. Lawrence Balls. Pp. xii+221. (London: A. and C. Black, Ltd., 1915.) Price 5*s.* net.

WITHIN the past few years numerous books and technical reports have appeared on the subject of cotton. The latest contributions are the two volumes before us, and both authors obtained their practical inspiration direct from the cotton fields of Egypt.

(1) Prof. Todd furnishes a review of the past history and present-day world's supply, on the basis of the trade statistics of all cotton-producing countries. It should prove invaluable alike to merchant and planter. It is fully illustrated with views of the cotton fields, the methods of transport, as well as numerous local incidents of interest in planting life. It moreover furnishes a series of ten maps to show the countries of production, the cotton areas of each being indicated by patches of vivid green. We would venture the suggestion that in addition to denoting the localities of recent expansion it would have been of advantage had some system of shading been pursued to indicate relative importance. For example, the first map, which shows the Indian localities, gives the valley of Assam coloured as fully and deeply as are Berar or Gujarat; all three might therefore be assumed to be equally important. So, again, while Prof. Todd gives the cotton areas of the United States of America as (approximately) 35½, India 24½, and Egypt 7½ million acres, the immense size of the green patch in the States conveys the impression of its being relatively larger than it is. It would have been a good plan, moreover, to have given numbers to the maps and to have shown these on the outside. In a like way we admit that trade names had to be given in a work of this nature, such as "Oomra-Wattee" (the modern Amraoti), but it would have facilitated reference had the orthography of the maps (Amraouati), at least, also appeared in the text.

An appendix affords what would seem to be full statistics (not always, we presume, easy to procure), and here brought into convenient form. A complete index has been given—a very necessary feature of a work of reference. The volume may be commended to persons in want of a book that deals briefly with every aspect of the commerce and agriculture of the world's cotton crop.

(2) Mr. Lawrence Balls's work furnishes the conclusions arrived at during an endeavour to improve the Egyptian cotton staple. If we differ from him in certain particulars we fully recognise the value of his labours. As a student of biology Mr. Balls has rendered a useful service, his contributions to the cytology and physiology of the cotton plant being welcome and of considerable importance. But in another branch of his studies he seems to have laboured under a delusion. It was unfortunate that the great urgency for research into the growth of the plant justified, in his mind, the setting on one side the results and evidences of systematic botany. He thus may be spoken of as having attempted to organise research on the exclusive basis of old pedigree selection and peripatetic Mendelian cross-breeding of undetermined stocks. In other words, he assumes that every investigator must deal with existing stocks and procure from these pure strains, but make little or no effort to derive new strains from internal or external sources.

As illustrative of Mr. Balls's disregard for the opinions of systematists it may be pointed out that he characterises scientific names as "merely useless duplicates of easier names." "Hindu-